Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PREFACE.

THE Committee of Correspondence and Papers, to whose care the publication of the Transactions of the Society is confided, present the following as the summary of the present Volume.

In the class of Agriculture, the large gold medal has been voted to Lord Newborough, for his extensive plantations of forest-trees in the counties of Caernarvon and Denbigh. The whole number of trees planted by his lordship is not far short of four millions, of which a fair proportion are oak, to stand for heavy timber. The Society have always encouraged the establishment of plantations on soil not adapted to more valuable crops; and perhaps not a single session has passed during the last sixty years or more, in which they have not had the pleasure of conferring at least one medal for this very important object. We know that, in more cases than one, the annual premium-book of the Society has suggested to landed proprietors the undertaking of extensive plantations; and although, no doubt, in a vast majority of instances, the motive to planting has been a long-sighted and wisely-regulated attention to self-interest, yet the Society, by the bestowal of their medals for such exertions, have made the volumes of their Transactions a valuable register of the dates and circumstances attending the establishment of plantations on all soils and exposures, and in the cheapest as well as in the most elaborate modes.

The silver Ceres medal has been voted to Joseph Houlton, Esq. for the introduction to public notice of a new esculent vegetable. The Stachys palustris, or March all-heal, is a plant not unfrequently occurring on the sides of ditches, or of moist rich corn-fields: it increases rapidly by creeping roots, and forms on these during the summer a number of thick, half-tuberous buds, from which the stems of the next year are to arise. From the end of autumn to the close of winter, these tuberous buds abound in a mild, somewhat sweetish, farinaceous matter, and are then fit for domestic use, being crisp, without fibre, and of a peculiar but scarcely perceptible flavour. The plant and roots are figured in Curtis's Flora Londinensis; but Mr. Houlton has the credit of having first suggested its use as an esculent vegetable, and of having made some experiments on the best way of cultivating it. In one respect the subject is interesting to the philosophical botanist, as offering, perhaps, the only known instance of a plant belonging to the natural order of the *labiatæ* producing farinaceous tubers capable of being applied to human food. In general, the only use derived from plants of this order is as condiments, like sage, mint, thyme, &c. or as affording essential oil, like origanum, rosemary, peppermint, and lavender.

In the class of Chemistry, the silver Isis medal has been voted to Mr. George Jackson, for his apparatus for instantaneous light. The singular fact that platina, in a state of very minute division, is capable of becoming red-hot when exposed to a stream of hydrogen gas, and then of inflaming the gas itself, was first discovered by Dobereiner. The construction of an apparatus whereby this property of platina is applied to the instantaneous production of a flame for the purpose of lighting a taper, is due to Gay Lussac. Mr. Jackson has made some modifications in the apparatus, which render it more portable, and, in the opinion of the inventor, less liable to be out of order.

The silver Isis medal and ten pounds have been voted to Mr. T. Cogan, for his method of purifying linseed and rape oils. There are two great uses to which oils expressed from seeds are applied, namely, to burn in a lamp, and, when mixed with white lead and other bases, to form oil-paint. The mucilage which all such oils contain is injurious to the former application of them, by clotting the wick, and thereby impairing the light; and the yellow colour which most of them naturally possess, degrades the tone of the white and other delicate colours when made into paint by mixture with them. Several years ago, M. Thénard, a celebrated French chemist, proposed the application of sulphuric acid in clarifying oils, which, though successful in a considerable degree, required a long and difficult process of filtration, in order to separate the clear oil from the impurities. Mr. Cogan retains the employment of sulphuric acid, but in a more dilute state than that in which it was used by M. Thénard; and by throwing in subsequently a considerable quantity of steam, causes all the impurities to settle by subsidence in the course of a few hours. The loss does not exceed three or four per cent, the whole of the operation of filtering is avoided, the entire process is completed in forty-eight hours, and the oil is far more limpid and colourless than before.

In the class of Mechanics, the gold Isis medal has been awarded to Mr. L. Hebert, for his substitution of plumbago instead of oil in diminishing the friction of the rubbing parts of clocks. Every one is acquainted with the effect produced by oil or grease in diminishing the friction of those pieces of machinery that are in common use; a stiff-going lock and a creaking hinge are both rectified by the application of a few drops of oil. But by long exposure to the air, oil is more or less changed; it becomes rancid and thick, and an acid is developed, which corrodes, and therefore injures more or less, the surface of brass, copper, or steel, with which it may be in contact; it also detains all those little motes or filaments, with which the air of inhabited places is filled, that may happen to touch it; and thus, in no great length of time, becomes foul, and requires to be renewed. All those instruments that, by the equable revolution of their parts, are intended to measure the lapse of time, are seriously affected in the regularity of their going by the progressive thickening of the oil by which the pivots and other rubbing parts are lubricated. Attempts have been made, but with no very great success, to retard this tendency of the oil to decomposition; and, in the higher-priced clocks and chronometers, the use of oil has to a certain degree been dispensed with, by making the caps and holes, in which the steel pivots turn, of ruby, or other hard and highly polished gems. Still, oil, or something equivalent to it, must be employed in some parts; and, in proportion as the mechanism of clocks approaches nearer and more near to perfection, it becomes of increasing importance to avoid the use of a substance that cannot be employed without introducing a cause of error, always increasing till it seriously affects the rate of going, and renders it necessary to take the instrument to pieces, in order to clean it and renew the oil. Plumbago, or, as it is usually called, black lead, is a soft, unctuous-feeling substance, which readily takes a high degree of polish, and therefore is well qualified, when interposed between two rubbing surfaces, to diminish greatly their mutual friction; it is also perfectly unalterable by exposure to air, has no chemical action on substances at any atmospheric temperature, and readily adheres, by a slight degree of rubbing, to any surface to which it may be applied. Mixed up with oil, it has occasionally been used for lubricating machinery, and it is understood to be the chief ingredient in the anti-attrition paste that is applied with such good effect to the axles of carriages. But even the finest plumbago, such as is used for the best black-lead pencils, contains certain gritty particles, which wholly prevent it from being applied in its natural state to reduce the friction of delicate clock-work. It is therefore subjected by Mr. Hebert to repeated grinding and washing over, in order to separate all its impurities, and is then applied in a state of powder, or mixed up into a soft mass, with a drop or two of pure spirit of wine. It readily adheres to the surface of a steel pivot, as well as to the inside of the hole in which it runs; so that the rubbing surfaces are no longer one metal upon another, but plumbago upon plumbago. These surfaces, by their mutual action, speedily acquire a polish only inferior to that of the diamond, and then the retardation of the machine from friction is reduced almost to nothing, and wear and tear from this cause is totally prevented. An astronomical clock of Mr. Hebert's own making, of which the pivots and holes, and teeth of the escape-wheel, had been covered on their rubbing parts with fine plumbago fourteen years before, was taken to pieces by the Committee: the surfaces of plumbago were found to be for the most part unbroken, and highly polished; and neither the pivots nor sockets appeared, on examination with high magnifiers, to have undergone the slightest degree of wear. It is evident that plumbago may be applied with equally good effect to other pieces of delicate machinery besides clocks; and the Society confidently anticipate that, by giving publicity to this invention of Mr. Hebert's, they are conferring on the community another of those benefits upon which alone they have ever been desirous to rest their claims on the good will and support of their countrymen.

The large silver medal has been voted to

Mr. W. Melvine, for his detached clock escapement; the large silver medal and five pounds to Mr. R. May, for his clock escapement; and the large silver medal and five pounds to Mr. T. Judge, for his self-adjusting pendulum.

There is, perhaps, no kind of machinery about which so much talent and ingenuity, so much manual dexterity and refined application of philosophical principles, have been employed as the construction of clocks and watches; and the Society have always shewn great readiness in granting to this department of Art all the encouragement which it is in their power to bestow. In so doing, they have proceeded on two principles, — the one, of rewarding and publishing such new modifications as appear to be decided improvements on the methods of construction actually in use; the other, of encouraging original invention and skill in young artists, even where the product of such skill is to be regarded rather as furnishing hints for improvement, than of immediate practical utility. It is an axiom in clock-making, that the more perfectly the escapement is detached from the train, the more accurately will the balance or pendulum perform its vibrations, and the more truly will time be measured. One method of effecting this is by means of a remontoire spring, several varieties of which have already been published. Mr. Melvine's and Mr. May's escapements are both of this kind; they are new and ingenious, and, while they do credit to the inventors, add to the resources of the art. Mr. Judge's improvement relates to another part of the machine. Spring pendulum clocks, especially those with small arcs of vibration, are often found to be out of beat when moved from one place to another, or when set on a table or bracket that is not perfectly level; and from the same cause will often stop altogether. Mr. Judge has avoided the inconvenience just mentioned, by supporting the part which carries the pendulum and pallets on the two collets which receive the axis of the escape wheel, and suspending from it a rod with a weight at its end, sufficient by its gravity to ensure the vertical position of the part to which it is attached, although the clock itself may be upon an inclined plane.

The large silver medal has been voted to Lieutenant Ackerley, R.N., for an appendage to ships' boats, especially those of men-of-war, consisting of certain bars, with cross pieces, let into the sides of the boat. These, in the event of the boat upsetting, slip out, and thus offer to the crew the means of holding on till they are relieved. An experiment with a boat fitted up as above described was tried at Plymouth, in presence of the admiral commanding in chief at that port, and of several naval captains, who have furnished the Society with testimonials in favour of the invention.

The large silver medal has been voted to J. Higgins, Esq. for his revolving light for steam-boats. If serious and often fatal consequences happen from ships under sail striking one another, still more likely is the event to be disastrous when two steam-boats, or one steam-boat and a sailing vessel, suffer this accident. The Society last year rewarded a contrivance by which a rotatory motion was given to two lamps at the ends of a long arm, by connecting it with the shaft to which the paddle-wheels are attached; such an arrangement will not only distinguish a steam-vessel from all others, but will also indicate, within certain limits, the rate at which it is going. The same general principle has been adopted by Mr. Higgins, except that only one of the lights is made to move; the apparatus is thus simplified and rendered less cumbersome, and consequently is more likely to be adopted.

The large silver medal has also been awarded to H. W. Hood, Esq. commander of his Majesty's ship Hyperion, for a floating bridge. The frigate commanded by this officer has been, during the last three years, stationed in the harbour of Newhaven for a particular service, in which it is very important that ready access should be had at all times from the ship to the shore. But although the vessel is moored within a short distance of the wall of the harbour, the bed of mud is so deep as to be wholly impassable, and the only time that communication could be maintained with the shore was at high-water by means of boats. The service intrusted to Captain Hood being materially impeded by this obstacle, he set himself to form a bridge by means of the cables, casks, gratings, and other articles, with which every ship of war is necessarily provided; and the result is a secure and very ingeniously constructed bridge, easily accessible at any time of tide, though the difference between high and low water in the harbour of Newhaven is not less than twenty-two feet. There are many similar situations, both at home and abroad, where it may be expedient to station ships of war, and in all such cases Commander Hood's invention will be found of great advantage.

Mr. Castell has had the silver medal voted to him for his improved mode of drawing off wine from the cask in order to bottle it. The double cock which he uses for this purpose expedites the business, occasions a less loss of liquor, and, by allowing it to flow continually, instead of with intermissions, as is the usual mode, avoids the risk of disturbing it till quite upon the lees

The silver Isis medal and five pounds have been voted to Mr. T. Chapman, for a new carriage adapted to Mr. Palmer's rail-way, by the use of which it is expected that increased facility will be obtained in passing from one line of direction to another, and in turning in short curves.

The silver Isis medal and five pounds have also been awarded to Mr. Alexander Bain, for his stamps for the use of bookbinders. These are in triangular pieces, are capable of being fixed on a frame in various positions and at various distances, so as to adapt them to books of different sizes, and to produce considerable variety out of a few simple elements.

The silver medal has been voted to Mr. W. Hilton, for his ladder-crane. There are many situations, especially in London, where, from want of room, heavy and bulky articles are obliged to be stowed away in cellars or vaults, the access to which is very inconvenient and contracted. The cellar of a warehouse occupied by Mr. Hilton is in this condition, the only entrance to it being by a trap-door and ladder. This ladder he has ingeniously converted into a crane at comparatively a small expense and very little increase of bulk, by means of which large articles may be lowered into, or raised out of, a cellar, with little trouble.

Two silver Isis medals have been voted, one to Mr. James Dowie, and one to Mr. Alexander Black, for their machine for the use of boot and shoe-makers. It is generally known, that the bent and constrained sitting posture in which the makers of boots and shoes perform their work, holding the materials on which they are employed between their knees as in a vice, subjects this class of artisans to chronic diseases of a very painful and afflicting nature, by which their health is often so seriously impaired as to leave no chance of relief except in the hard alternative of quitting their occupation, — an alternative which, to any man, and especially to those who earn their daily bread by their daily labour, cannot but be productive of great anxiety, and is too often attended with the breaking up of those habits of industry and regularity on which depend the respectability of the individual and the welfare of his family. The Society have always shewn themselves very desirous of encouraging inventions that have in view the prevention of these calamities; and have at different times rewarded and published machines specially for the use of the very numerous class of workmen who are employed in boot and shoe-making. These machines may be seen in the Society's repository, but have only been occasionally adopted; because, although the principles of their construction are good, the details are defective. The machine of Messrs. Dowie and Black, while in principle it is nearly the same with those already invented, has been formed with such a clear professional knowledge of the objects to be aimed at and of those to be avoided,—has been arranged with such excellent contrivance and with such simplicity of movement,—as apparently to leave nothing farther to be desired. Mr. Dowie, who is a master boot and shoe-maker, has introduced the use of the machine among his own workmen, and it is beginning to be adopted by others of his townsmen in the same line of business.

The large silver medal and twenty pounds have been voted to Mr. M. Mottershead, for his expanding metallic piston for high-pressure steam-engines. In the low-pressure steam-engine, the temperature of the steam employed is seldom more than a few degrees above that of boiling water, and therefore in this the piston or plunger is surrounded with a band, or packing, as it is technically called, of greased hemp or cotton, which, by its equable pressure against the sides of the cylinder, prevents the loss of steam, while it adds as little as possible to the labour of the engine. But where steam at a heat much higher than that of boiling water is used, the packing is so rapidly destroyed as to require constant reparation. To avoid the trouble and expense thus occasioned, expanding pistons, made entirely of metal, have been proposed and made trial of. As far as can be judged from the construction and excellent workmanship of Mr. Mottershead's piston, corroborated by the trials that have been made of it in two or three engines, it seems likely to answer its intended purpose, at least as well as any of the expanding pistons now in use.

The silver Isis medal has been voted to Mr. T. E. Bonner, for his door-lock.

The gold Isis medal has been voted to Mr. Joseph Clement, for his improved turning lathe. A difference exists, though perhaps it may be difficult to define the boundaries with much precision, between those engines or machines that are intended to produce manufactured articles in the usual sense of the word, (that is, articles immediately applicable to the supply of human wants,) and those of which the produce consists in such parts as enter into the construction of machines of the former class. The loom, the lace frame, the machine for spinning cotton, the stocking frame, the corn mill, are examples of the first kind; the wire-drawing machine, the engine for cutting the teeth of wheels, the turning lathe, are examples of the second kind. To a person unacquainted with mechanics, the former class are the most interesting: the sight is dazzled by the rapid motion, and the imagination is bewildered by the immense complexity of parts, each performing its office with undeviating regularity, and the understanding is interested by following the successive changes undergone by the raw material in its progress to the complete manufactured fabric. We admire the master mind that has so combined all these movements and processes as to obtain from their concurrent action a definite and useful result. If, however, we analyse all this seeming complexity, we shall soon find that it reduces itself to a few movements — to a small variety of parts repeated over and over again — and in which very great precision is far from being requisite to the production of the manufactured article; because the manufactured article itself may vary within certain limits, and continue equally applicable to the use for which it is intended. An inch in length of a piece of fine muslin may contain twenty-nine threads, and another inch in the same piece may contain thirty threads, and the difference shall be quite imperceptible even to the most practised eye. But no mechanical motion can be produced without the expenditure of power; and of this power a part only is really employed in effecting the intended object, the remainder being lost and dissipated in consequence of the imperfection of human workmanship. In some machines it has been found, that the power thus lost has amounted to by far the greater part of that originally employed; and as all first movers are costly, whether live power, the expansion of bodies by heat, or the force generated by the impulse of air or water in motion, it has of late years been an object of great solicitude to economise as much as possible the power which we have at our disposal. This is effected by increased precision and accuracy of fitting in those parts which, by their motion on one another, transmit the primary impulse to the place where the force is to be exerted. But it is obvious that, whatever precision the machine possesses, at least an equal degree of accuracy of adjustment must exist in the tool or machine by which it is made. If the cylinder of a steam-engine is rejected, which, with a diameter of five feet, varies in any part more than the 80th of an inch, the lathe by which the demanded truth of bore is given to it must be at least equally true. Before the invention of the slide-rest had relieved the workman from the necessity of holding the cutter in his own hands, such precision was quite impossible; but, since that invention, improvements have been continually making on the lathe for turning metal, so as to convert it into the most accurate and most extensively applicable of all tools. Flat surfaces of unrivalled correctness have of late been produced by it, and it is to this employment of it that Mr. Clement's improvement particularly applies.

It is evident, when the mandril of a lathe, having a metal plate fixed to it, turns round with a uniform motion, and the slide-rest which carries the cutter is moving from the circumference of the work to the centre, that the quantity of metal passing over the edge of the cutter at each revolution, and therefore at equal intervals of time, is continually diminishing, in exact proportion to the diminution of the spiral line described by the cutter on the face of the work. But in turning metal plates it is exceedingly disadvantageous to increase the speed of the work beyond a certain quantity; for when this happens, the edge of the cutter is broken and made dull, and the surface of the plate becomes indented and burnished, instead of being turned. The speed, therefore, must not exceed that which is suited to the work at its circumference, although for every other part it is slower than might safely be used in proportion to the approach of such part to the centre. Hence results a loss of time on the part of the workman, and of work done on the part of the instrument, which, considering the capital and skill expended in the construction of a first-rate lathe for turning metal, is a matter of no small importance. Mr. Clement has overcome this, almost the only remaining imperfection in the lathe, by making it self-regulating; so that, whatever be the situation of the cutter, equal quantities of metal shall pass over it in equal times, at the same time giving the workman the power of converting the varying rate of the mandril into a uniform one whenever he chooses.

The silver Isis medal has been awarded to Mr. Andrew Smith, for his lever cramp—a simple and extremely well-contrived instrument of great power, which has been very successfully applied by him to bring the edges of flooring boards in close contact previously to their being nailed down. It avoids the objections to the use of the other instruments that have been heretofore employed; and may, no doubt, be used by the carpenter for other purposes than that for which it has been primarily intended.

The large gold medal has been voted to J. P. Holmes, Esq. for an improvement in obstetrical instruments; and the silver Isis medal to Mr. Gibson, for a spoon of a particular construction, for administering medicine to children or lunatics. In voting the above rewards, the Society have acted in conformity to the opinions of eminent professional men, well qualified to give a sound judgment on the matters in question.

In the class of Manufactures, the large gold medal has been voted to C. T. Tower, Esq. of Weald-hall, Essex, for his flock of cashmeer goats, and for a shawl manufactured from their down.

A genuine cashmeer shawl of fine quality is one of the most precious of the manufactures of the East, on account of the exquisite softness and fineness of fibre of the material of which it is composed. Unsuccessful attempts had been made by two or three individuals to obtain, through British interest in India, a few of the cashmeer goats, in order to ascertain whether the breed could be naturalised in this country; and the gold medal of the Society has, for some years, been offered with the same view, in order to keep the public attention fixed on the subject. Equal anxiety has been shewn in France to introduce the shawl-goat into that country; and two French agents, under the patronage of the Emperor Napoleon, were sent to Persia for the purpose of making purchases of goats, in the province of Caspahan, of the genuine cashmeer breed. A considerable number of these animals was procured, and brought to Paris in the year 1823. Mr. Tower, happening to be then in that city, purchased four of these goats, two males and two females, and succeeded in conveying them safely to his residence in Essex. The animals have continued in health, and have multiplied rapidly; so that his present flock consists of twenty-seven, including the four original ones. They shew no impatience of cold, and are very healthy, requiring only the occasional protection of a shed in very rough weather. Their favourite food is the gorse or furze, which they devour eagerly, without being annoyed by its prickles. Their coat is long, coarse hair, intermixed with fine down, which begins to be loose early in April. Some of this down has been made into a shawl 54 inches square. The yarn was spun by Messrs. Pease, of Darlington, and was woven by Messrs. Miller and Sons, of Paisley. On examination by competent judges, it has been declared considerably superior to shawls made either in France or in Scotland, of the down from the original French flock; whether it is that the race has really deteriorated in France, or that Mr. Tower's down is purer, that is, better sorted, than the French. Since the subject has been before the Society, his Majesty has been pleased to transmit, through an official channel, his approbation of Mr Tower's exertions. He has also been pleased to accept a pair of the goats, and the shawl exhibited to the Society has been presented to his Majesty as the first specimen of British art exercised on cashmeer down grown in Great Britain. The down produced by each goat is so small, that it can never become cheap; and if the manufacturers have the good sense resolutely to abstain from mingling it with any baser material, they may secure to themselves and to the country the credit and profit of an article that will always be valuable from its intrinsic qualities, and fashionable from its dearness and comparative rarity.

The silver Isis medal has been voted to Mr. R. Lloyd, for his samples of sheet cork. The principal use to which sheet cork has hitherto been applied is, as a material for socks or internal shoe soles, in order to protect the feet from damp. But from the mode by which thin plates of cork have hitherto been formed, the texture is more or less shattered, and therefore the utility of it much restricted. Mr. Lloyd has very successfully adapted the engine used for splitting skins to cutting plates or sheets of cork. The texture of the material is thus preserved unshaken, and he is enabled to produce sheets not more than a 32d of an inch thick. The inventor himself has applied sheet cork to form the frame-work of hats; and there is no doubt that many other uses will soon be discovered for it.

In the class of Colonies and Trade, the gold Ceres medal has been awarded to a very interesting communication from the Reverend Lansdown Guilding, of the island of St. Vincent, respecting the insects which infest the sugar-cane in the West Indies. The plates are copied from Mr. Guilding's drawings, and have been presented to the Society by R. H. Solly, Esq.

The gold Isis medal has been awarded to W. Green, Esq. of Quebec, secretary to the Literary and Philosophical Society at that place, for a description, accompanied by samples, of several substances, both mineral and vegetable, the produce of Canada, from which valuable paints for the use of artists may be prepared. The samples, on their arrival, were put into the hands of artists, members of the Society, who have reported very favourably respecting them. As Mr. Green's communication was transmitted to the Society of Arts at the desire of the Quebec Society, it was thought right to forward the medal to its president, the Earl of Dalhousie, governor of the colony, with a request that his Lordship would present the same to Mr. Green. This arrangement has the more readily been agreed to, because the noble Lord is also a member of the Society of Arts, and has taken great pains in making known to the colony over which he presides the list of premiums specially intended for the colonial possessions of the British nation.

The gold Ceres medal has been awarded to Gregory Blaxland, Esq. of Sydney, in New South Wales, for a sample of wine, the produce of his vineyard in that colony. Five years ago the large silver medal of the Society was conferred on this gentleman for a sample of wine from the same vineyard. The vines with which it is stocked are derived from a small black cluster grape, supposed to be a seedling from one of the claret grapes originally introduced by Mr. Blaxland. Being a native of that colony, it endures the climate far better than any of the imported vines. The wine sent this year is decidedly better than that for which the former reward of the Society was granted. It cannot be expected that the produce of such young vines should have much flavour; but as the stocks get older and less succulent, the quality of their juice will no doubt improve. At present, it is praise enough, that the wine is sound and perfectly free from that flavour which characterises, not advantageously, the wines of another British colony.